

low temperatures and snow along their routes. On the 20th forecasts of high winds were sent to Nevada and Utah. On November 21 the morning forecast for southern California was "heavy rain this afternoon, to-night, and Thursday, with snow in the mountains and dangerously high southerly winds." High winds were also forecast for other parts of the district. Shipping and railroad interests were advised of heavy rains and high southerly winds. The forecasts were fully justified. The clearing weather which followed the storm was also accurately forecast.—*A. G. McAdie, Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

Following the storm of the 1st an unusually long period of fine weather prevailed, which terminated in a severe cold spell, attended by snow and blustering northeast winds that overspread the North Pacific States the night of the 17th and continued until the 22d. Freezing temperatures were experienced to the coast line for three days, and east of the Cascade Mountains zero temperature was reported at Spokane and Walla Walla. Both the cold weather and snow were accurately forecast, as was also the break to warmer, which occurred several days later. The warnings of cold were the means of saving several big shipments of potatoes that otherwise would have been frozen. Marine interests were kept fully advised of the approach of gales and high winds.—*E. A. Beals, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

During the month there were charted eleven highs and sixteen lows. A brief description of their movements and more prominent characteristics is given herewith.

Highs.—For the first time since May, 1900, with the exception of a portion of July, the highs exhibited a southeastward tendency, and the paths of a majority of them at times reached below the fortieth parallel. Nos. I, III, VII, and XI originated in the extreme central west, but pursued widely different paths. No. I moved from the Indian Territory northeastward to Ontario, and thence along a somewhat devious path to the Atlantic Ocean by way of Cape Breton Island. No. III originated in southeastern Wyoming and moved almost due southward through central Texas into the Gulf of Mexico. No. VII moved from the Kansas River Valley to West Virginia in twenty-four hours, and there disappeared, while No. XI maintained a fairly direct eastward movement from southeastern Wyoming to the Virginia coast. No. II first appeared on the Washington coast, moved eastward to North Dakota, and thence south-southeastward through Missouri and Mississippi into the Gulf of Mexico. No. IV moved from Columbia, N. W. T., to the Saskatchewan Valley, thence southeastward to the lower Ohio Valley, and thence eastward off the southern New Jersey coast. No. V followed much the same path as No. IV. Nos. VI and VIII moved across the extreme north from Alberta to the Atlantic Ocean. No. X was first noticed over northern Lake Superior, and from that section eastward followed very nearly in the paths of Nos. VI and VIII.

The characteristic winter type of high prevailed over the Plateau region except from the 14th to the 22d, inclusive, continuing at the close of the month.

Lows.—The lows were numerous and fairly regular in movement. Nos. I, V, XIV, XV, and XVI, moved eastward over the extreme north, No. I coming in over the Oregon coast. No. XVI dissipated in western Ontario, while the remaining three passed out the St. Lawrence Valley. During its progress No. V dipped down into the southern portion of the upper Lake region, afterward resuming its easterly course. Nos. XI, XII, and XIII, originated in the central Rocky Mountain

region, Nos. XI and XII passing into the Atlantic by way of the St. Lawrence Valley and Nova Scotia. No. XIII first traveled southeastward through the Southern States, turning northeastward after reaching central Alabama. It passed into the ocean off the southern New Jersey coast, and was afterward noted at Halifax, N. S., Sydney, C. B. I., and St. Johns, N. F. No. X originated in southwestern Montana, and moved down the eastern slope of the Rocky Mountains to central Texas, where it disappeared. Nos. IV and IX originated in the middle Mississippi Valley, the former moving to eastern Lake Erie, and thence south-southeastward to the Virginia coast, and the latter to the Atlantic Ocean just north of latitude 45°. No. VI was a local disturbance of great intensity that moved from southeastern New York through New England to the country north of the Gulf of St. Lawrence. Nos. II and VIII originated in the south Atlantic States, and both were last noticed in the vicinity of Bermuda.

From the morning of the 15th to the evening of the 19th a low of decided character was persistent near the Oregon, Washington, and British Columbia coasts, the barometer readings ranging in the neighborhood of 29.50 inches, and the depression extending into the north and middle Plateau region. It began to move southward during the night of the 19th, disappearing off the California coast during the night of the 20th.—*H. C. Frankenfield, Forecast Official.*

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	1, a. m.	34	96	4, a. m.	46	60	2,500	3.0	833	34.7
II.....	6, a. m.	47	123	10, p. m.	30	88	2,440	4.5	542	32.6
III.....	8, p. m.	48	122	12, p. m.	28	98	2,745	4.0	688	28.6
IV.....	12, a. m.	51	120	15, a. m.	40	75	2,725	3.0	908	37.8
V.....	14, a. m.	53	109	17, p. m.	41	70	2,400	3.5	686	26.6
VI.....	16, p. m.	54	114	20, a. m.	48	54	2,750	3.0	917	38.2
VII.....	21, a. m.	39	95	22, a. m.	38	80	800	1.0	800	33.3
VIII.....	22, p. m.	50	108	25, p. m.	46	60	2,365	3.0	755	31.5
IX.....	33, p. m.	50	110	29, a. m.	36	84	2,775	4.5	617	25.7
X.....	26, p. m.	48	85	29, p. m.	46	60	1,345	3.0	448	18.7
XI.....	28, p. m.	42	105	1, a. m.*	37	76	1,715	2.5	686	28.6
Sums.....							24,460	35.0	7,878	328.8
Mean of 11 paths.....							2,224		716	29.8
Mean of 35 days.....									699	29.1
Low areas.										
I.....	1, p. m.	45	117	4, p. m.	48	68	2,825	3.0	942	39.2
II.....	3, a. m.	34	82	5, p. m.	32	65	1,075	2.5	430	17.9
III.....	5, a. m.	45	73	6, a. m.	46	60	700	1.0	700	29.2
IV.....	6, a. m.	41	96	8, a. m.	37	76	1,400	2.0	700	29.2
V.....	7, p. m.	54	114	12, a. m.	48	68	2,490	4.5	553	23.0
VI.....	8, a. m.	41	74	10, a. m.	48	68	650	2.0	325	13.5
VII.....	11, p. m.	48	85	13, a. m.	48	68	900	1.0	900	37.5
VIII.....	11, p. m.	32	81	13, a. m.	32	65	1,000	1.5	667	27.8
IX.....	12, p. m.	43	91	14, p. m.	46	60	1,700	2.0	850	35.4
X.....	13, p. m.	47	112	15, a. m.	31	101	1,325	1.5	883	36.8
XI.....	17, a. m.	41	107	21, p. m.	48	68	2,425	4.5	539	22.5
XII.....	21, p. m.	40	105	24, a. m.	48	54	2,675	2.5	1,070	44.6
XIII.....	21, p. m.	41	111	25, a. m.	48	54	3,840	6.5	591	24.6
XIV.....	25, a. m.	53	121	29, a. m.	45	80	2,325	3.5	664	27.7
XV.....	27, p. m.	54	114	1, a. m.*	46	78	1,800	4.0	514	16.7
XVI.....	30, a. m.	54	114	2, p. m.*	47	85	1,550	2.5	620	25.6
Sums.....							30,280	48.0	11,348	472.8
Mean of 17 paths.....							1,781		667	27.8
Mean of 48 days.....									631	26.3

*December.

RIVERS AND FLOODS.

The Mississippi River from its source to the mouth of the Illinois River was somewhat lower than during October, 1900; from the mouth of the Illinois to the mouth of the Ohio there was but little change, while below the mouth of the Ohio stages